

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

REC'D 10 SEP 2004



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| Applicant's or agent's file reference ACH 3003 WO | FOR FURTHER ACTION See Notification of Transmittal of International PCT Preliminary Examination Report (Form PCT/PEA/416) | |
| International application No. PCT/EP 03/06033 | International filing date (day/month/year) 05.06.2003 | Priority date (day/month/year) 11.06.2002 |
| International Patent Classification (IPC) or both national classification and IPC C10G65/04 | | |
| Applicant NIPPON KETJEN CO. LTD. | | |

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:
 - I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

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|---|---|
| Date of submission of the demand 25.11.2003 | Date of completion of this report 10.09.2004 |
| Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016 | Authorized Officer Zuurdeeg, B Telephone No. +31 70 340-4467  |

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/EP 03/06033**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-20 as originally filed

Claims, Numbers

1-10 filed with telefax on 02.07.2004

Drawings, Sheets

1/5-5/5 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

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5. ☒ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

see separate sheet

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | |
|-------------------------------|-------------|------|
| Novelty (N) | Yes: Claims | 1-10 |
| | No: Claims | |
| Inventive step (IS) | Yes: Claims | |
| | No: Claims | 1-10 |
| Industrial applicability (IA) | Yes: Claims | 1-10 |
| | No: Claims | |

2. Citations and explanations

see separate sheet

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Re Item I

Basis of the report

The applicant has deleted the word "heavy" in claim 1.

No basis for this amendment could be found in the specification as originally filed.

The deletion of this feature introduces subject-matter which extends beyond the content of the application as filed, contrary to Article 34(2)(b) PCT.

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following documents:

- D1: US-A-4 054 508 (MILSTEIN DONALD ET AL) 18 October 1977 (1977-10-18) cited in the application
- D2: US-A-5 744 025 (BOON ANDRIES QIRIN MARIA ET AL) 28 April 1998 (1998-04-28) cited in the application
- D3: PATENT ABSTRACTS OF JAPAN vol. 2000, no. 16, 8 May 2001 (2001-05-08) & JP 2001 003066 A (IDEMITSU KOSAN CO LTD), 9 January 2001 (2001-01-09) cited in the application
- D4: US-A-4 431 525 (HENSLEY JR ALBERT L ET AL) 14 February 1984 (1984-02-14) cited in the application

2. Clarity

2.1 It is clear from the description on pages 9-13 that the following features are essential to the definition of the invention:

- (i) HDM catalyst has a surface area of 50-200 m²/g and average pore diameter of 10-35 nm (page 9, line 23-page 10, line 2);
- (ii) HDS catalyst has a surface area of 50-400 m²/g and average pore diameter of 5-20 nm (page 10, line 27-page 11, line 2);
- (iii) HDAsp catalyst has a Group VIB metal content of 2-20wt%, a Group VIII metal content 0.5-6 wt%, a surface area of 50-200 m²/g, an average pore

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- diameter of 10-35 nm and 0.3 ml/g or less of pore volume in pores with a diameter of 100 nm or larger (page 11, line 15-page 12, line 22);
- (iv) HDS catalyst has a Group VIB metal content which is at least 2 wt% higher than the Group VIB metal content of the HDM catalyst and the HDAsp catalyst, calculated as trioxide (page 13, lines 6-12);
 - (v) the average pore diameter of the HDS catalyst is at least 1 nm below the average pore diameter of the HDM and the HDAsp catalyst (page 13, lines 13-16).

Since independent claim 1 does not contain these features it does not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain all the technical features essential to the definition of the invention.

It is considered that these features are essential because the accompanying explanations in the passages cited indicate that only with their inclusion is the problem as described on pages 3-4 solved across the breadth of claim 1. It also appears that the examples in accordance with the invention all possess these additional features (Article 33(3) PCT considered in combination with Article 6 PCT).

If any or all of these features are not essential, then this may be established by providing examples having the combination of features of present claim 1, but lacking the features (i) - (v) above, and showing that these achieve the combination of effects as claimed in the description and illustrated in the examples.

The applicant's comments in the letter of reply do not establish that these features are not essential.

- 2.2 Claims 1-10 do not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The claims attempt to define the subject-matter in terms of the result to be achieved which merely amounts to a statement of the underlying problem. The technical features necessary for achieving this result should be added, i.e. process conditions and catalyst definitions.

3. The subject-matter of claims 1-10 is novel because none of the cited documents

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disclose an asphaltene removal step at the high temperature end of each of the at least two reactors (Article 33(2) PCT).

Documents D1, D2 and D4 all disclose the hydroprocessing of a heavy (asphaltenes comprising) hydrocarbon feed with a catalyst system consisting of three catalytic beds/layers of specific pore sizes (see D1: column 3, line 49 to column 8, line 50; D2: column 1, line 52 to column 5, line 65; D4: column 3, line 19 to column 11, line 10). D1 and D4 mention respectively slow ageing and a lined-out deactivation rate that is very low. The process of D4 provides a product having reduced amounts of metals, asphaltenes, nitrogen compounds and sulfur compounds.

4. In view of the objection in point 2.1 above, it has not been established that the problem as described in the paragraph bridging pages 3 and 4 of the application is solved by the process as defined. Accordingly, an inventive step cannot be recognised (Article 33(3) PCT).